Roy F Weston, Inc
Suite 5700
700 5th Avenue
Seattle, WA 98104-5057
206-521-7600 • Fax 206-521-7601
www rfweston com

**MEMORANDUM**

DATE 23 December 1998

TO: David Bennett, WAM, U.S. EPA, Region X

FROM: Michelle Turner, Chemist, WESTON, Seattle
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Polychlorinated Biphenyls (Aroclor) Data
Laboratory Batch· K9806374
Site: Duwamish River

WORK ASSIGNMENT NO 46-23-0JZZ

WORK ORDER NO.: 4000-019-038-5200-00

DOC. CONTROL NO.: 4000-019-038-AAAK

cc. Bruce Woods, RAP-WAM, U S. EPA, Region X
Dena Hughes, Site Manager, WESTON, Seattle (memo only)
Kevin Mundell-Jackson, Database Management, WESTON, Seattle

The quality assurance review of ten sediment samples, laboratory batch K9806374, collected from the Duwamish River has been completed. Samples were analyzed for polychlorinated biphenyls as Aroclors using EPA Method 8082 by Columbia Analytical Services of Kelso, Washington. The samples were numbered:

| | | | | |
|---|---|---|---|---|
| 98384000 | 98384001 | 98384002 | 98384003 | 98384004 |
| 98384005 | 98384006 | 98384007 | 98384008 | 98384009 |

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract The review follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240 1-05, February 1994)

1 Timeliness

All samples were extracted 38 days after sample collection, exceeding the 14 day holding time criteria in the Sampling and Analysis Plan However, prior to extraction, samples were stored frozen, thus extending the holding time. Samples were extracted within the 12 month holding time recommended by PSEP for frozen samples.

2. Initial Calibration

a) Mixed Aroclor 1016/1260 Standard

A six point initial calibration was performed. Calibration factors were calculated for a minimum of five peaks, none of which are common to both Aroclors The calibration factor percent relative standard deviation (%RSD) was less than 20 percent for all peaks used for quantitation.

b) Individual Aroclor Standards

Calibration factors were calculated from a mid-range standard for the other 5 Aroclors using 3 to 5 peaks.

3. Calibration Verification

Aroclor 1016/1260 calibration verification standards were analyzed every 12 hours using a midrange standard. The calibration factor percent difference was less than 25 percent of the initial calibration value

4. Retention Time Windows

Retention Time Windows were calculated from initial calibration Retention times for calibration verification standards were within established windows.

5 Detection Limits

Instrument detection limits met project required quantitation limits

6 Blanks

a) Laboratory Method Blanks

Laboratory method blank frequency criteria were met

No target analytes were reported in laboratory method blanks.

b) Field Blanks

No field blanks were associated with this laboratory batch.

7 System Monitoring Compounds (Surrogates)

Surrogate compound percent recovery met quality control criteria for all samples.

8 Matrix Spike and Matrix Spike Duplicate

All matrix spike (MS), matrix spike duplicate (MSD) and relative percent difference (RPD) results were within QC limits.

9. Laboratory Control Sample (LCS) Analysis

LCS recovery goals for Aroclors were established in the project Sampling and Analysis Plan at 70 to 130% for sediment. Based on conversations with the laboratory, historical control chart limits of 26 – 142 for Aroclor 1016 and 40-139 for Aroclor 1260 were also used for data qualification

All LCS percent recoveries met QC guidelines (P-project, L-laboratory) with the following exceptions:

| Sample | Compound | Percent Recovery | QC Limits |
|---|---|---|---|
| K981022-LCS | Aroclor 1016 | 66 | 70-130 (P)<br>26-142 (L) |

Results for compounds listed above were qualified as estimated (J) Undetected results were also qualified as estimated (UJ)

10. Field Duplicate Analysis

No field duplicates were associated with this SDG.

11 Second Column Confirmation

The Relative Percent Difference (RPD) in reported analyte concentration was greater than 35 percent for the primary and confirmation column for the following samples:

| Sample Number | Compound | DB-5 Conc (µg/Kg) | DB-1701 Conc (µg/Kg) | RPD |
|---|---|---|---|---|
| 98384001 | Aroclor 1254 | 60 5 | 87 9 | 37 |
| 98384002 | Aroclor 1260 | 222 | 305 | 51 |
| 98384005 | Aroclor 1260 | 42 1 | 70 1 | 50 |

Differences can arise from analytical interferences on one column However, the RPDs are not deemed significant at the reported concentrations. The lower concentration was reported for each analyte.

12. Sample Analysis

A cursory review of raw data was performed. All laboratory deliverables were present and complete A duplicate analysis was performed on Batch QC sample K9806066-002. RPDs between duplicate results were all less than 10 percent The case narrative indicated that the project specified holding time did not apply as samples were frozen prior to processing No complications were noted in the case narrative.

13 Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The compound was analyzed for, but was not detected.

UJ - The compound was analyzed for, but was not detected The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less then CRDL or lowest calibration standard

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

N - Presumptive evidence of presence of material (tentative identification).

I - Elevated reporting limit due to matrix interference

## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Roy F Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384000 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-001 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/29/98 | ND | UJ |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/29/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/29/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/29/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/29/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/29/98 | 36 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/29/98 | 38 | |

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Approved By C. Vogel Date 11/10/98

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Roy F. Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

### Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384001 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-002 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | UJ |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 60 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 63 | |

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Approved By D. Nagel Date 11/14/98

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Roy F Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384002 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-003 | Basis | Dry |
| Test Notes. | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | UJ |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 678 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 222 | |

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Approved By E. Wright Date 11/10/98

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

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|---|---|---|---|
| **Client:** | Roy F Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384003 | Units: | ug/Kg (ppb) |
| Lab Code. | K9806374-004 | Basis. | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND UJ | |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 85 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 57 | |

Approved By D. Wiegel Date 11/10/98

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

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|---|---|---|---|
| **Client:** | Roy F Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

### Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384004 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-005 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND UJ | |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 610 | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 1050 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 1180 | |

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

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|---|---|---|---|
| **Client:** | Roy F. Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

### Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384005 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-006 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND UJ | |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 51 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 42 | |

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Roy F Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name: | 98384006 | Units | ug/Kg (ppb) |
| Lab Code: | K9806374-007 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | UJ |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |

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Approved By D. Weigel Date 11/10/98

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Roy F. Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

### Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384007 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-008 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | UJ |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 86 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 100 | |

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Approved By D. Wiegel Date 11/10/98

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Roy F Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384008 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-009 | Basis | Dry |
| Test Notes | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | UJ |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 96 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 62 | |

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Roy F Weston, Inc | **Service Request:** | K9806374 |
| **Project:** | Duwamish River/4000-027-001-2019-38 | **Date Collected:** | 9/14/98 |
| **Sample Matrix:** | Sediment | **Date Received:** | 9/15/98 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name | 98384009 | Units | ug/Kg (ppb) |
| Lab Code | K9806374-010 | Basis | Dry |
| Test Notes. | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | UJ |
| Aroclor 1221 | EPA 3550B | 8082 | 40 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1232 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1242 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1248 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | ND | |
| Aroclor 1254 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 57 | |
| Aroclor 1260 | EPA 3550B | 8082 | 20 | 1 | 10/22/98 | 10/30/98 | 50 | |

Approved By D. Weigel Date 11/10/98

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